




UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,122	01/20/2004	Donald C. Abbott	TI-33737A	3955
23494	7590	12/13/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			ROMAN, ANGEL	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	
			2812	

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/762,122	Applicant(s) ABBOTT ET AL.	
	Examiner Angel Roman	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/20/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 16, 17, 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. Japanese Patent 359161850 A.

Suzuki et al. discloses a method for forming a semiconductor device and a leadframe comprising: providing a copper lead frame 6 including a chip-mount pad and a lead segment having a first end near said mount pad and a second end remote from said mount pad; forming a nickel layer 8 over an entire surface of said lead frame 6; forming a layer 11 of silver on said nickel layer selectively, covering said first end of said lead segment; attaching an integrated circuit chip 4 to said mount pad; applying a layer 10 of pure tin solder selectively, covering said second end of said lead segment; and bending the lead segment for solder attachment (see figure 5).

3. Claims 16, 17 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Mahulikar et al. U.S. Patent 5,540,378 A.

Mahulikar et al. Prior Art discloses a method for forming a semiconductor device and a leadframe comprising: providing a copper lead frame 12 including a chip-mount

pad and a lead segment having a first end near said mount pad and a second end remote from said mount pad; forming a nickel layer 20 over an entire surface of said lead frame 12 (see figure 1A); forming a layer 22 of silver on said nickel layer 20 selectively, covering said first end of said lead segment; attaching an integrated circuit chip 16 to said mount pad; applying a layer 28 of pure tin solder selectively, covering said second end of said lead segment; and bending the lead segment for solder attachment (see figure 1C).

4. Claims 16-18, 20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al. U.S. Patent 5,424,578 A.

Fujita et al. discloses a method for forming a semiconductor device and a leadframe comprising: providing a copper lead frame including a chip mount pad 90 and a lead segment 80 having a first end near said mount pad 90 and a second end remote from said mount pad 90; forming a nickel layer 50 over an entire surface of said lead frame (see figure 3); forming a layer 81 of silver on said nickel layer 50 selectively, covering said first end of said lead segment; attaching an integrated circuit chip 111 to said mount pad 90; applying a layer tin solder 30 selectively, covering said second end of said lead segment, the tin layer 30 comprises pure tin in a matte, coarse grain, low carbon content, and annealed composition with a thickness of about 4-6 micrometers (see column 11, lines 4-8); and bending the lead segment for solder attachment (see figure 8).

5. Claims 16-18, and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinghorn U.S. Patent 5,635,755 A.

Kinghorn discloses a method for forming a semiconductor device and a leadframe comprising: providing a copper lead frame including a chip mount pad and a lead segment having a first end near said mount pad and a second end remote from said mount pad; forming a nickel layer 48 over an entire surface of said lead frame (see figure 7); forming a layer of silver or palladium 44 on said nickel layer 48 selectively, covering said first end of said lead segment; attaching an integrated circuit chip 50 to said mount pad; applying a layer tin solder 46 selectively, covering said second end of said lead segment, the tin layer comprises pure tin in a matte, coarse grain, low carbon content, and annealed composition with a thickness of about 4-6 micrometers (see column 6, lines 6-9); and bending the lead segment for solder attachment (see figure 7). Kinghorn also discloses the palladium or silver layer having a thickness of about 20-60 micrometers (see column 7, lines 35-37).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kinghorn U.S. Patent 5,635,755 A.

Kinghorn is applied as above but lacks anticipation on disclosing the tin solder having a reflow temperature of 232 degrees Celsius. It would have been obvious to a person having ordinary skills in the art at the time the invention was made to disclosed a solder reflow temperature of 232 degrees Celsius in the primary reference of Kinghorn since Kinghorn discloses using tin which has a conventional reflow temperature of about

220-240 degrees Celsius (see non-patent literature citation; Zarlink Pb-Free/RoHS Strategy).

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 16 and 22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,706,561 B2. Although the conflicting claims are not identical, they are not

patentably distinct from each other because the references indicated above disclose a method of forming a lead frame for use in the assembly of integrated circuit devices, comprising; providing a base metal structure having a plated layer of nickel fully covering said base metal structure; forming a layer of pure tin on said nickel layer selectively, covering an area of said lead frame suitable for attaching a circuit chip; and forming a layer of palladium or silver on said nickel layer selectively, covering an area of said lead frame suitable for attaching a bonding wire.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang et al. discloses a method of making a metal plated leadframe.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (571) 272-1681. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2812

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR
December 8, 2004


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800